Abstract

It is accepted that the effective uptake of academic research into policy and practice requires the active involvement of stakeholders. However understanding participation from the perspectives of stakeholders remains poorly understood. We show that non-academic participants bring multiple knowledges and expertises vital to research. We demonstrate that flexibility in terms of how research is framed, conducted and in the meaning of what constitutes 'success' is crucial. We argue that research needs to move towards co-produced transdiscplinary research. In doing so research can be more representative of stakeholder interests and knowledges and also make important contributions to academic impact.

Keywords: transdisciplinary; interdisciplinary; co-production; stakeholder; dialogue.

1 Introduction

Over the past decade an increasingly dominant discourse has sought to promote the idea that a large measure of the value of research lies in its utility to stakeholders with specific interests in a research or policy field and to the public at large (OECD, 1979; Pielke 2007). In the UK, research funding bodies and research programmes have placed an increasing emphasis on engaging publics and stakeholders, and on creating 'pathways to impact' through which the outcomes of research can be fed through into decision making and ways of working in the wider world. Alongside emphasis on the need to involve users in the research process has come an emerging realisation that effective research uptake in policy and practice is founded on active knowledge exchange and stakeholder engagement in knowledge production itself (Phillipson et al., 2011; Wesselink et al 2011; Macnaghten and Chilvers 2012). Research has explored how stakeholders are involved in academic research (Moore and Koontz, 2003; Margerum, 2008; Phillipson et al., 2011), who is included in the research process (Reed et al., 2009), rationales for participation (Wesselink et al., 2011; Jolibert and Wesselink, 2012) and how different types of knowledge can and should be integrated (Failing et al., 2007; Macnaghten and Chilvers 2012). However, to date there has~~s~~ve only been limited investigations as to what the stakeholders themselves feel about being involved in academic research and which aspects of participation they found valuable. Research that has examined what stakeholders think about being included in academic research has focused on the views of non-academic experts (e.g. Jolibert and Wesselink, 2012; Renner et al, 2013), with reflection carried out by the academics themselves rather than asking what the stakeholders thought (e.g Jolibert and Wesselink, 2012; Renner et al, 2013). Often assessment is also about projects that have included non-academic experts, but not the wider public (see section 2 for definitions). We argue that speaking to both non-academic experts AND the wider public is critical to understand their perspectives on being involved in academic research, especially if the promises of engagement and impact are to be realised.

Interdisciplinary and transdisciplinary research have come to symbolise a broad shift in research agendas towards an emphasis on utility (Wolfram et al., 2013; Lang et al., 2012). These types of research are often thought to be of particular value in solving problems and addressing real world concerns (Horlick-Jones and Sime, 2004; Petts et al., 2008), and as such frequently involve specific forms of outreach and engagement. The Rural Economy and Land Use (RELU) programme, funded jointly by the Natural Environment and Resources Council (NERC), the Economic and Social Science Research Council (ESRC) and the Biotechnology and Biological Sciences Research Council (BBSRC) is one example of where the framing of research as interdisciplinary has been accompanied by a strong emphasis on the involvement of non-academic experts and publics. The programme aimed to: deliver integrative, interdisciplinary research of high quality that advanced understanding of the challenges faced by rural areas and the relationship between them; enhance capabilities for research on rural issues between social, natural and biological sciences; and enhance the impact of research on rural policy and practice by involving stakeholders in all stages. Transdisciplinary research, in which those affected by the issues with which it is concerned, or have a stake in the issue, has also been a feature of the programme. This approach is based on the understanding that there are many equally legitimate sources of knowledge and evidence that need to be drawn upon to inform management of environmental problems (Wynne, 2003; Petts, 2007; Lidskog, 2008; Collins and Weinel, 2011). This understanding is linked to an increasing expectation that policy makers should be using the best available evidence from research when making decisions (Campbell et al., 2011; Jolibert and Wesselink, 2012) which includes a variety of perspectives, recognising that evidence, ideas, arguments and framings all matter in the governance of environmental problems (Jasanoff 2003; Owens, 2010; Macnaghten and Chilvers 2012).

In this paper we examine the processes of engagement and impact from the perspective of the stakeholders involved in academic research. We are especially concerned with the process of recruiting stakeholders into research, how recruitment may influence the process and outcome of

participation and what the stakeholders may get out of being involved. In the first part of the paper, we examine why the involvement of stakeholders has come to be a critical part of research before examining the ways in which this takes place. We set out the methodological approach adopted in this study in the second part of the paper. In the third section, we examine four core themes that have emerged through this research: the rationales adopted for getting involved in research from the perspective of stakeholders; the ways in which different forms of expertise are communicated and negotiated; the importance of flexibility whilst undertaking research; and shared ideas about what 'successful' research involves in making participation work. In the final part of the paper, we reflect on these themes and draw out the implications for the growing involvement of non-academic experts and the wider public in academic research.

2 Interdisciplinarity, transdisciplinarity and the participation of stakeholders in research

The roots of interdisciplinarity are well researched and it is accepted that the term has multiple meanings "from simple borrowings and methodological thickening to theoretical enrichment" (Klein, 1996, p. 153). Some have therefore suggested that, "interdisciplinarity is best understood not as one thing but as a variety of different ways of bridging and confronting the prevailing disciplinary approaches" (Huutoniemi et al., 2010, p. 80). Since the mid-1990s, there have been increasing calls for interdisciplinary approaches to research, especially in studies concerning the natural environment. Accompanying this shift has been an increasing emphasis on the need to engage a range of actors, from wider publics to specific stakeholders, in the research process itself (Irwin, 2006). However, while the rationale and practice of engaging publics in the research process has received significant attention in academic debate (e.g. Arnstein, 1969; Owens, 2000; Bloomfield et al., 2001; Abelson, et al., 2003; Bulkeley and Moll, 2003; Pain, 2004), less attention has been directed specifically to the role of *stakeholders* in the research process. While the term 'stakeholder' is loose and fluid, here we interpret it as meaning a person, group, or organization for whom the project is a 'matter of concern' (Latour, 2004) (i.e. are affected by the issue at hand) which is either

personal (e.g. with regard to a specific area in which they live) or professional in nature (e.g. where research is undertaken in a specific policy sector in which they also work). Stakeholders can be defined and classified in many different ways. Throughout this paper we refer to; academics, (i.e. those involved in conducting research), non-academic experts (i.e. people who have expertise related to an issue under study such as professional environmental managers); and the wider public, (i.e. people with local knowledges). We recognise that the distinction between academics, non-academic experts and the public is not clear-cut, with expertise, knowledge and motivations being overlapping and complex. A stakeholder may also have attributes related to more than one of these groups, for example be an environmental professional and live locally to the area of concern. 'Local' knowledge, built from experience of living in a place over an extended period of time, is also dynamic and evolving (Bracken and Oughton in press) and can be accumulated by working in a particular location, or on a particular issue, for an extended period. However, despite these fluid classifications, we use the above labels in this paper to recognise the inclusion of multiple perspectives in the research projects.

2.1 Bringing stakeholders into research: utility and the extension of expertise

Interdisciplinarity has become a common heuristic across different areas of science and policy, while for some it is increasingly recognised as a "master steering mechanism in government science policy" (Lowe and Phillipson 2009: 167). Interdisciplinarity has become not only an explicit objective of research funding, but also a key means of generating science policy (Strathern, 2004; Jolibert and Wesselink, 2012; Macnaghten and Chilvers 2012). These moves towards interdisciplinarity can be situated within a wide shift from Mode 1 to Mode 2 knowledge production whereby mode 1 knowledge production is investigator-initiated and discipline-based while mode 2 is problem-focused, interdisciplinary and context led (Gibbons et al., 1994; Nowotny et al., 2001). However, of particular importance in the context of this paper has been the growing emphasis on *transdisciplinary* research, in which not only are the boundaries between disciplines crossed but so

too are those between the academy and other social and political spheres such that a wide range of actors are involved in the design, development and delivery of research (Petts et al., 2008; Wesselink 2009; Wesselink et al., 2011; Jolibert and Wesselink, 2012; Lang et al., 2012; Renner at al., 2013). That such approaches are increasingly encouraged and celebrated is, we suggest, due to two related rationales: first, they are likely to make research more *useful* to academics, policy makers and the wider public; second, that they enable the research that is undertaken to be more *salient* (i.e. that it more broadly reflects the interests of those involved).

The general argument that more interdisciplinary and transdisciplinary research is required has particularly been applied to what have been labelled messy, complex or wicked problems (Johnson, 2008; Donaldson *et al.,* 2010), based on the premise that the associated collaboration and networking involved will produce innovative concepts and methods to answer complex research questions that are beyond the expertise of individual disciplines (Petts *et al.,* 2008; Donaldson *et al.,* 2010). Beyond this broad sense of producing 'useful' research, interdisciplinary and transdisciplinary work is also increasingly seen as a means through which to create *usable* research; that is, research that can be readily taken up in a range of public and policy contexts (Lemos and Moorhouse, 2005; Jolibert and Wesselink, 2012). Stakeholder involvement in the research process, either as the target for communication or as active participants, is a means of increasing the utility of research and the likelihood that it will shape the decisions, actions and capacities of these individuals and organisations. This is partly because the contingent societal judgments and values of more than just academic researchers and policy makers become an integral part of the process (Macnaghten and Chilvers 2012).

A second, related, rationale for the involvement of stakeholders in research is broadly concerned with the *saliency* of research. Here we use saliency to mean the perceived *relevance* of the research to those involved. The involvement of publics and non-academic experts in the research process

142 increases the relevance of the research to them, widens the range of knowledge upon which the
143 research draws (e.g. local and professional) and in so doing explores the values of non-academics
144 and their perspectives about what is right, or not. Calls for direct public participation in the
145 governance of science and in wider decision-making processes concerning the environment have
146 been gathering momentum over the last few decades (Irwin, 2006). Within the UK, the development
147 of deliberative techniques for public participation are to be found in policy documents, for example,
148 the Royal Commission on Environmental Pollution (1998). In this way legislation and regulation make
149 explicit references to the need for public involvement and dialogue with science and scientists to
150 legitimate research. Recent policy assumptions and rhetoric are also concerned to restore public
151 trust through participatory processes such that scientific and technological developments can
152 proceed through broad social consensus (Irwin 2006).
153
154 Beyond a concern with enhancing the democratic qualities of scientific research, the emphasis
155 placed on bringing non-academic experts and the public into the research process is symptomatic of
156 the recognition that what constitutes relevant knowledge is not contained within the academy.
157 Rather, recognising knowledge as a social process means acknowledging that expertise is conferred
158 upon individuals in different and multiple circumstances (Jasanoff, 2003; Wynne, 2003; Irwin, 2006).
159 A number of empirical studies have demonstrated that practices of academics and non-academic
160 experts may be at odds with the contextual knowledge of people in their local environment
161 (Harrison et al., 1998; Irwin et al., 1999; Wynne 1991). Local knowledge has often been uncritically
162 rejected because it has been viewed as insufficiently objective and insufficiently rigorous in terms of
163 methods and documentation (Wynne, 1991; Yearley, 2000). The commitment to involving
164 stakeholders in the research process seeks to counter such trends, placing emphasis instead on the
165 potential value of 'local' knowledge and the knowledges of a range of actors who may have other
166 kinds of interests in the issue in question. Such forms of research are therefore part of complex
167 struggles over 'what' is going to count as relevant knowledge and subsequently 'who' then

possesses such knowledge to inform policy debates within the public arena (Jasanoff, 2003; Eden et al., 2006; Bracken and Oughton, in press).

2.2 Fostering stakeholder participation

Despite renewed interest in the participation of stakeholders in the research process, no one blue print exists for how this might be achieved. Rather, there is an evolving spectrum of ways in which stakeholders can be involved in academic research (Lang et al., 2012; Phillipson *et al.,* 2011). These vary from stakeholders being research subjects (e.g. a respondent to survey, interviewed, observed), participating in events, being a member of a steering or advisory group, a funder where research is commissioned, or a project partner where the stakeholder may just be interested in the academic results, a partner who supplies resource (money, time, data) or a partner where the research is devised through negotiation.

Phillipson *et al.* (2011) undertook a detailed analysis of projects funded by RELU to explore how stakeholders had been involved under the transdisciplinary ethos of the Programme. A total of 21 projects were surveyed which involved more than one thousand stakeholders in the process of research. The analysis showed that most stakeholders were involved as research subjects or as participants in research events, although a large number were also involved in other aspects including shaping the research undertaken. Different types of stakeholders were found to be involved in different ways. Existing research has suggested that researchers should pay more attention to how stakeholders are engaged in research projects and how this relates to knowledge exchange during the lifetime of the research (Lang et al., 2012; Phillipson *et al.,* 2011). In a related study ~~Jolibert and~~ Wesselink et al. (201~~2~~1) found potentially conflicting rationales for participation by professionals involved with environmental governance throughout Europe and that most engagement was at the project dissemination stage. Results led the authors to conclude that there is

193 a need for more reflexive awareness of how participation is defined and practised for a more
194 realistic assessment of the possibilities for participatory and deliberative decision making.
195
196 Despite calls for increasing participation from non-academics in research the voices of stakeholders
197 themselves, especially the wider public, remain rather absent and silent; that is transdisciplinarity is
198 not being considered from the perspective of those we work with and for. In this way
199 transdisciplinarity remains predominantly an academic and policy discourse where the merits,
200 problems and potential of using such an approach are internally debated. In the sections below, we
201 detail how we designed a process that sought to initiate discussions with stakeholders about their
202 own views of their role and what they have gained from the process, before analysing and reflecting
203 on the findings from these discussions.
204
205 **3 Methods**
206 In order to understand the views of stakeholders concerning their role in, and experience of, the
207 research process, we ran a one-day workshop with those who had participated in projects that were
208 part of the RELU programme. Approximately 94 projects were funded between 2004 and 2012 at
209 different scales (1 to 3 year projects). As already noted earlier RELU had an explicit objective of
210 supporting transdisciplinary research and in so doing introduced new outlooks on innovation that
211 emphasised coupled socio-technical change rather than narrow technological outcomes. Our choice
212 of a workshop as a suitable means through which to elicit views about stakeholder participation was
213 determined by: (a) a wish to explore how stakeholders related their experiences within a social
214 setting, akin to focus group methods, such that views are articulated, challenged, reconsidered and
215 settled in the process of research; and (b) seeking to design a process that the stakeholders
216 themselves would find of value. Individual stakeholders who we had worked with before, both
217 through our own involvement in the RELU programme as well as other research projects, had
218 occasionally expressed the desire to understand how other stakeholders had addressed challenges

219 they had faced as well as to share their own experiences. A workshop provided the possibilities of
220 enabling participants to discuss their experiences with each other as well as organising parts of the
221 day as reflective discussions using a focus group methodology.
222
223 All principal investigators (PIs) of RELU funded projects were contacted to ask to request that the
224 non-academics involved in their research talk to us about their perspectives on being involved in
225 academic-led inquiry. We received a mixed response to this call. Some PIs were happy to ask for
226 volunteers, others did not want to trouble their stakeholders with extra meetings. Participants were
227 self-selecting from those projects were the PI was happy to ask project stakeholders for
228 involvement. Hence representation may be dominated by those with complaints; or inclusion may
229 reflect the zeal that proponents have about their involvement. Nine people attended the workshop
230 representing six different research projects with participation having occurred in different ways in
231 the research process. Five of the participants were people who lived in areas where research
232 projects were undertaken (community representatives) and four were practitioners from different
233 organisations (non-academic experts). Some community representatives had initiated their own
234 mini-projects under the research funding; others had been involved in larger, academic led projects.
235 The non-academic expert participants came from a range of organisations; consultancy, regulatory
236 institutions and non-governmental organisations involved in environmental management. The
237 projects represented were all exploring ways in which to maximise opportunities for environmental
238 management by exploring multiple perspectives of processes and governance, but were based
239 around different elements of the landscape; rivers, lakes and the urban-rural transition.
240
241 The workshop focused on two issues; i) processes and mechanisms of involvement within research
242 projects; and ii) the types of knowledge and evidence gained from being involved with academic
243 research and whether this was beneficial to stakeholders. We were keen to understand the different
244 views on being involved in transdisciplinary research projects and also whether it was possible to

trace any of the project's impacts into people's own professional or personal lives. Discussion was informal, free flowing and participant led. Discussions were recorded and transcribed, and a thematic analysis of the transcript conducted in which key phrases and ideas were identified and then coded and this process replicated across the transcribed material.

4 Stakeholder perspectives of academic research

Discussions revealed four critical themes that shaped stakeholder involvement in transdisciplinary research: motivations for being involved; a process of communication that enabled dialogue to take place; flexibility throughout the project that created a meaningful space for participation; and an ability to value multiple outcomes and outputs as signifying the success of the project. Frustrations were also apparent.

4.1 Getting involved

Some respondents had a very simple reason for getting involved in academic research; they found the subject or topic interesting. Not all stakeholders choose to get involved in research to better their environment, some wished to gain knowledge for its own sake, rather than towards some kind of purpose. Yet for the majority of participants, it was the environmental problem that was being addressed in the research project that drew participants into the research with many stakeholders having a real interest in wanting to better understand the science for professional or personal purposes.

> *"we were hoping that the information gained from the project would help us sort of further our knowledge in those areas."* Non-academic expert 1

By getting involved in academic research stakeholders wanted to improve their knowledge. Often this desire was linked to the hope that a better understanding may help stakeholders gain additional

legitimacy for their own knowledge and to find new ways of working to resolve on-going debate and disputes:

> *"we've got a load of academics here, it's a great learning opportunity, I can … find the facts the real facts of the issue and that means hopefully people trust, will trust what I say and you know treat me with some respect."* Public 1

> "*I still believe that knowledge, when people are more knowledgeable about each other, then it's easier to resolve conflict".* Non-academic expert 2

The use of the term 'real facts' is interesting because it suggests that this participant, a member of the public, feels a lack of validity in their own knowledge compared with the knowledge of others (academics and non-academic experts). Beyond improving their own ability to debate the issues at hand, it was the prospect of a 'technical solution' that was a key motivation for those with an explicit professional or personal interest in the issue to get involved. This in turn meant that stakeholders had a strong desire and need to be involved not only in *general* but with the *specifics* of the research at hand. Where people felt excluded from the technical and scientific aspects of the projects or where such 'technical solutions' were not in fact produced by the research team, conflicts ensued:

> *"there were certain things on the technical side to do with ... natural sciences that I felt it ignored completely and it could have encompassed some work on without going into the technical detail we've got a very important technical area which we've got no information on at all."* Public 2

> *"I think a lot of the community thought one of the outcomes would be scientific knowledge and evidence which would tell them how to [manage the environment]*

and I think they feel that that hasn't happened ... I don't think the project was ever designed to do that and the aims of the project were never that really, but I'm not sure that the people who are coming along to the meetings, the community … stakeholders … understood." Public 3

Thus the reasons for becoming involved in academic research were varied, but all participants hoped to get something out of the project, ranging from increased levels of knowledge, to gaining understandings that could be used by stakeholders in their professional or personal lives, to finding solutions to complex, real word problems. Where differences emerged between what it was that stakeholders had hoped to gain and what was actually possible through particular research projects, conflict was common. Critical to preventing and managing such tensions were a variety of forms of communication.

4.2 Communication as dialogue

At one level, overcoming some of the challenges of the dissonance between stakeholder views of what projects might involve and the understanding of the issues being addressed on the one hand and the research process on the other hand was seen as a matter of simply improving communication (e.g. Bracken and Oughton 2006):

"I think the scientists didn't make enough of the opportunity they had to explain some of the very simple things that underpin the science of .... which I still think a lot of people in the valley simply do not understand". Public 2

"what he would use to describe something, the language he would use to describe something was totally different to what we as the community people used but it meant exactly the same thing." Public 1

Stakeholders involved in different projects experienced very different levels of communication, from a lack of basic information about what was happening in the project and when, to a lack of explicit explanation of key issues and terms. There was evidence that some of the researchers involved in the projects had taken this task to heart, and had become adept at 'translating' their research in ways that could be readily understood by the community-based stakeholders involved so that the process of knowledge generation became iterative, produced through continual questioning, revision, reframing and further discussion:

> *"... either me or Don[1] said we don't get it and then, bless them, [they] explained it in words that we could get and I have to say we have chemists in our groups and what have you, but I think the answer was we weren't going to just sit there and at the end of the evening go away and say well we didn't understand a word, we were going to actually say sorry I can't get my head round that one and I'm not apologising for not being a scientist it's just we couldn't do it. Then and I know Damian[1] particularly used to go away didn't he and consider how he expressed himself and then come back and do it better and that was brilliant and then we got it and then we told him, we've got it now, we can understand what you're saying to us which was much better for the group."* Non-academic expert 3

Central to this more iterative process of producing knowledge was the view that participants should be able to disagree without being disagreeable:

> *"... you've got to get in and say it as it is and in a sense it was far better and it should have been done earlier and not just me, there were other people being very British and not upsetting people's feelings and if they'd have got in there and everything was*

[1] Names have been anonymised.

discussed openly, I know it's a very difficult subject but that honesty and that and being able to take either criticism or justify what you're doing." Public 1

Some workshop participants had had a very different experience from the above quote and felt they had not had the opportunity to fully question or understand someone else's perspective and/or knowledge. These participants felt that no one in their project had gone away and thought about something that had been asked and then reported back at a later meeting. Hence the stakeholder felt that the project had not achieved as much as it might have in terms of co-producing knowledge. When stakeholder engagement worked well both the stakeholders and academic researchers were influenced by each other's knowledges to think differently and conduct research in novel ways:

"Yes rather than accepting if someone bases their position on a certain number of facts, a certain basket of information, which they accept as blank you know de facto, when you start to unpick that and better understand where that knowledge has come from and how it's contextualised, if people do that in a group each other's knowledges become part of the assessment." Non-academic expert 4

Working in this way enabled everyone to move beyond their 'comfort zones' so that the involvement of stakeholders resulted in new understandings and approaches to thinking about the purpose of research, how it should best be conducted, and what a successful outcome might involve. When this process was successful, it often involved different forms of 'knowledge brokerage', from the use of facilitators to the creation of specific dialogues aimed at engaging with the range of expertise around the table:

"... a key aspect of the Heather Valley Project[1] was to define where that knowledge was, who had it and how it could be used. In other words it does question some of the

kind of traditional status of the scientists coming in from the outside, not in terms of their knowledge but in terms of their capacity to apply that and transform or change anything." Public 4

Embracing the idea that knowledge was multiple that local knowledge mattered and that knowledge was as likely to be held by non-academics (both expert and the public) as by the academic researchers was critical to the development of such dialogues. Occasionally, the iterative negotiation of knowledge and the development of sustained dialogues about the research process led to the research project evolving differently from how it had originally been conceived. Stakeholders felt that negotiation and working iteratively helped them to expand their knowledge about an issue, understand each other's views and hence helped reach common understanding. In short, such a process enables the *co-production*[2] of research, which in turn facilitated a sense of collective ownership and an increase in the confidence of participants to independently take research findings forward.

4.3 Making space for participation

Critical to the co-production mode of transdisciplinary research experienced by some of the stakeholders was that there was flexibility within the research process, in terms of how it was framed, conducted and in the meaning of what constituted 'success'. From the outset, openness was seen as critical:

[2] The term co-production has come to have numerous meanings and interpretations within a broad range of academic disciplines. At a meta level it has a *constitutive or descriptive* emphasis that denotes the relationship between knowledge and social order (Jasanoff, 2003). Co-production is also Prescriptive in that it is a normative statement about democratizing expertise through public participation (Callon, 1999). Finally, co-production has been seen to be *emancipatory* to participants through its promotion of self-knowledge (Kindon et al., 2007).

"... we could offer up communities who would be keen you know to become involved or whatever but it became apparent that that definitely wasn't the case and that the projects were all pretty much all decided on what their case studies were so the opportunity was for us to go and visit them rather than to actually be a part of the research projects." Non-academic expert 4

Without leaving the terms and parameters of research open to dialogue, the initial motivations that may draw stakeholders into the research process may be lost. Furthermore, workshop participants suggested flexibility is needed by both academic researchers and non-academics to learn from each other and to develop methods, approaches, outputs and deliverables according to the dialogue and iterative development of the research project. Although researchers may have clearly outlined intentions at the outset of a project, the iterative process of engagement means that there needs to be space in the project for these to alter and evolve as a consequence of the dialogue created in the research process. For instance one project had evolved dramatically following dialogue between project members that led to the research being done differently than planned. Following group discussions one of the academics did some extra, non-planned research:

" he went away and did some modelling on that and it completely changed the tack of the project, well not completely but quite severely affected the way that the project went and I think they were quite happy to go with that, go with the flow." Public 1

For this to take place the stakeholders and researchers needed to be joined in co-production of knowledge, there needed to be mutual respect between project members and there needed to be flexibility in terms of the overall research project from researchers and funding providers to allow such a change to occur. Where such spaces for participation were created, and the co-production of

research made possible, stakeholders had a very positive feeling of being listened to and being completely involved in the research:

> *"the fact that we had control or some control of where we were going made people feel really proud of it at the end because they all said exactly the same in many different guises"* Non-academic expert 3

4.4 Measuring success

'Measures of success' in a transdisciplinary project can be highly variable and require some 'imaginative thinking' by assessors of research to fully capture the range of ways in which research might be considered to have succeeded. Participants discussed a variety of such measures that included issues such as: 'credibility by association' leading to an increased confidence in locals taking project findings forward; publications (academic, policy, local); redistributing expertise such that local knowledges are given recognition alongside accredited expertise; 'solving' an issue; providing tools (i.e. maps or models etc) and policy impacts. Some of these can be assessed relatively easily (such as publications), while others - such as increased confidence- are far more intangible in nature but considered just as important by participants.

Most of the workshop participants felt that being engaged and enrolled in academic research had been enjoyable and interesting. They mostly felt their reasons for getting involved in the first place were upheld. For instance one stakeholder noted that:

> *"I think it's broadened the knowledge, it's broadened our knowledge of the difficulties of it and it's also as I said it's also brought out the differences … We're all gaining a greater understanding of what everyone wants within the … and I think from that aspect it's been a great success."* Non-academic expert 2

Stakeholders were also happy to embrace some more intangible successes. For instance there was an interesting discussion of the outcomes for communities where research was located and the impact and benefits. Positive outcomes included: engendering discussion amongst local people, including those not actually enrolled in the research; bringing unknown community expertise to the fore and enabling the community to move forward either around particular debates or challenges, or in terms of creating greater knowledge and communication amongst community members. Participants appreciated that the accumulated knowledge will not necessarily be utilised immediately, but will be there to provide benefit to the community at some point in the future. Rather than thinking only of the immediate impact of research, workshop participants were keen to point to the longer term and more intangible nature of the effects of being involved in the research process:

> *"it's about mobilising and making a community conscious of its own problems 'and of its own capacity to solve and to produce sustainability, that is radical"* Public 4

For some, engagement in academic research has given them both confidence, new understandings, and project outputs which have enabled them to sustain a voice in high profile dates around environmental management.

6 Discussions

Few studies have tried to understand what stakeholders feel about being involved in research and how academics could work differently to develop more successful transdisciplinary practices. This research makes an important contribution to both better understanding the motivations of non-academic experts and the public in taking part in academic research and what it is they value in such research. We argue that such research is vital to developing more sustainable transdisciplinary

research through greater reflections on the relationships between “science” and the “public”’ as suggested by Irwin and Wynne (2003, p7). The participants at our workshop were drawn from a variety of different types of stakeholder (non-academic expert and the wider public) and had been involved in academic research in a range of ways; from subjects in focus groups, members of competency groups, through to Participatory Action Research, advisory panellists and by undertaking work shadowing. We have shown that stakeholders have multiple interests and reasons for getting involved in academic research although a desire to acquire new knowledge, either for its own sake or around a particular issue, was pertinent to all participants. Furthermore, a common thread that unites the stakeholders we engaged with is that they all advocated a research process that is open, based on dialogue, flexible, and where there are multiple measures of success. Our results therefore agree with Phillipson *et al.,* (2011) who found that different stakeholder relationships were associated with the contributions that these people made to research projects and that different sectors of stakeholders gained different benefits from being involved

A number of authors have raised the issue of ‘stakeholder fatigue’ in participatory research and suggested that it can in part be due to the ephemeral nature of knowledge and poor communication within research projects (Du Toit and Pollard., 2008; Holman, 2013; Renner et al., 2013). We saw this play out in practice when PIs refused to ask stakeholders with whom they worked to take part in our research. Yet, participants in our project confirmed that they would continue to take part in academic research if they found it interesting and relevant to their needs. We therefore suggest that the issue of ‘stakeholder fatigue’ may be lessened and more sustainable participation maintained if academic projects engage and communicate more effectively with stakeholders. To this end we suggest that it is essential that there is flexibility in research project design and/or the research process to enable thoughts, ideas and suggestions from stakeholders to be incorporated from conception to outputs within projects. It was also clear that stakeholders valued and appreciated the debated and contested nature of the knowledges produced in their projects. This

498 led to them gaining a better understanding of other people's perspectives (both from each other and
499 academics), which were then applied, either through professional and/or personal routes, in their
500 own contexts. Consequently, our research supports Irwin et al.'s (2012) claims that working in such
501 ways can counteract the 'exclusionary and socially disengaged policy tradition characterized by
502 invocation of the objective authority of scientific expertise' (Irwin *et al*. 2012, 128). This finding
503 reinforces the models of transdisciplinary research proposed by Lang et al, (2012) and Jolibert and
504 Wesselink (2012) where stakeholders are involved from the very start of the research process to
505 help frame the research and develop common understandings. We found that non-academic experts
506 and the wider public had similar experiences of being involved in academic research and both gained
507 substantial knowledge and enjoyment. This is an important finding because often the wider public
508 have not been included in transdisciplinary research, only scientists and practitioners (e.g. Lang et al,
509 2012; Jolibert and Wesselink, 2012; Renner et al., 2013).
510
511 The aspect that varied most between the stakeholders was the benefits achieved from being
512 involved in academic research. Phillipson et al. (2011) noted that there was a positive impact on
513 research relevance and quality, but the impact on stakeholder practices or knowledge seemed slight.
514 Our results demonstrate that the impacts on stakeholders were very positive and can be significant.
515 The difference between our findings and the study by Phillipson et al (2011) is likely to be due to the
516 way in which stakeholders were engaged in the evaluation of their engagement. Phillipson et al
517 (2011) used questionnaires, which enabled more stakeholders to participate, but questions would
518 have been more directed and less able to elicit in depth answers from participants. In contrast, our
519 focus group conversations were participant led and allowed to evolve in whatever direction
520 participants chose. Hence participants could suggest a wider range of benefits offering a deeper and
521 more nuanced understanding of the benefits they gained from being involved. All stakeholders
522 valued the increased stock of brokered knowledge that was gained through the co-production
523 process and suggested that this had made a difference to them even without giving an explicit

524 impact or change to their daily ways of working (practice). In other words the process itself was of
525 value to them independent of any specific outcomes a finding that questions those who argue for
526 the ephemeral nature of co-produced knowledges (i.e. Holman (2013)). Participants in our focus
527 group felt a personal pride at being involved in their respective research projects, even if something
528 concrete had not been attained, although as mentioned above the new networks and brokered
529 knowledge were judged to be incredibly valuable to participants. Another important finding from
530 our research was the value of what we refer to as the 'intangible impacts' on stakeholders of being
531 involved in participatory research. These ranged from increased personal confidence, learning
532 languages of other stakeholders to their continued engagement once researchers had completed
533 their studies. We strongly suggest that academic researchers and funders should give more
534 attention and value to recognising the more intangible benefits to stakeholders as well as the more
535 explicit management outcomes in its assessments of the 'success' of such projects.
536
537 Our research has shown that both non-academic experts and the public strongly feel that their
538 judgments and values should be regarded as an integral part of the research process, as proposed by
539 Macnaghten and Chilvers (2012). Furthermore, we argue that flexibility, openness and the iterative
540 development of projects enable stakeholders to contribute to the co-production of knowledge and
541 enjoy being part of the research process. This we argue would go some way to challenging
542 previously published research where legitimacy has been used in reference to determining whether
543 a stakeholder holds the 'right' type of knowledge and experience to bring to transdisciplinary
544 research (e.g. Lang et al., 2012; Renner et al., 2013). While such approaches support the inclusion of
545 stakeholders at the outset of the research process to shape projects, it remains the role of
546 academics to determine which stakeholders hold 'relevant' knowledges or expertise's to be invited
547 into the research (e.g. Lang et al., 2012; Renner et al., 2013). We argue that such approaches
548 maintain the authority of scientific knowledges and expertise, while continuing to marginalise or

549 even ignore the judgments and values of the wider public, based as these are in what might be
550 termed more 'local knowledges'.
551
552 The open nature of our discussions with stakeholders also enabled them to articulate their
553 frustrations at being part of academic research projects. The two main sources of frustration to
554 them were poor communication and a lack of continuation of the research projects they had been
555 part of. Participants outlined their frustrations that at times their expectations of being involved in
556 academic research were sometimes not being met; misunderstandings about what the aims of the
557 research were; and a lack of opportunity to engage in dialogue with the academics. Previous work
558 has also noted the negative impact on transdisciplinary research of poor communication (Lang et al.,
559 2013; Renner et al., 2013). Poor communication could lead to feelings of cynicism (Holman, 2013)
560 and limit the engagement and potential of collaboration with stakeholders. However, good practice
561 by academics could prevent these issues arising in the first place. The frustration around the limited
562 time frame of academic research is a more complex structural issue to resolve. From a stakeholder
563 perspective there were further frustrations that just as the groups were getting going, had come to a
564 common understanding about the research and had found their voice, the research ended.
565 Furthermore, many would have been happy to give more of their time, especially if they had
566 continued input to shaping the research.
567
568 *"I was very surprised that they hadn't got a follow on project in mind given that we*
569 *generated more questions than there were at the beginning probably but it's just from*
570 *their point of view it's just stopped which is why we try to continue it".* Public 2
571
572 Follow on funding can be crucial to the development of ideas emerging from a research project or
573 the evolution of novel ways of working with stakeholders to achieve a certain outcome. Continued

574 funding is also crucial to access the stakeholder platform (engaged participants, mutual trust,
575 common languages and understanding) that has been developed.
576
577 **7 Conclusions**
578 ~~The models of collaboration and rationales for participation outlined in section 2 do not take into~~
579 ~~account the usability of knowledge nor different types of expertise.~~ By exploring the view of
580 stakeholders engaged in academic research we have shown how transdisciplinary research can
581 embrace multiple forms of knowledge and how the expertise of stakeholders can be enhanced by
582 the credibility and saliency of the knowledges co-produced. Our work has highlighted that
583 stakeholders felt that negotiation and working iteratively helped them to expand their knowledge
584 about an issue, understand each other's views and hence helped reach common understandings for
585 themselves and for academics. Based on these findings we suggest the following be taken into
586 consideration for any future transdisciplinary research:

587 • Stakeholder involvement in academic projects should reflect the 'matter of concern' rather
588 than pre-determined 'types' of stakeholder or their associated knowledges and expertise.
589 • Stakeholders need to incorporate as broad a range of knowledges and expertises as possible,
590 even if this means people have to work outside of their 'comfort zones'.
591 • Issues should not be pre-determined without involving non-academic experts and the public
592 since this is likely to alienate people from the process.
593 • Research should be realistic about what a project can deliver, not necessarily 'promising a
594 solution'. Expectations and any changes need to be managed through the lifetime of
595 project.
596 • Research needs to break down knowledge barriers: the science needs to be explained clearly
597 and effectively, its limits understood and any uncertainties discussed. Stakeholders need to
598 be encouraged to question and to promote their own understandings.

- The heterogeneous nature of knowledge means that projects need to ensure that dialogue between different stakeholders remains open and positive, making the role of facilitator particularly important.
- Academics need to be reflexive in working in such projects and think creatively about the most useful way to communicate their science.
- Engagement with stakeholders should be iterative giving the opportunity for both academics and stakeholders to questions and learn from each other to develop common understandings.

We also suggest that this research has pertinent recommendations for funding institutions. Firstly, we suggest that flexibility needs to be built into the research design and methods to enable the knowledges of stakeholders to be both incorporated and to evolve throughout the research process. While we support that having stakeholders involved at the outset of the research process, including incorporating their ideas and expertise into the project formulation, we recognise that this can be problematic. Firstly, working in this way is demanding on resources (time and money), which are hard to find before a project is successfully funded. Secondly, stakeholders are easily let down if they have participated in project development and subsequently funding is not secured. This potentially undermines relationships and networks and can damage future collaborations. Thirdly, research projects may evolve dramatically once stakeholder input is secured leading to changes in methods, objectives and case studies. This potential for change should be communicated effectively both within the project team and between the researchers, stakeholders and the funding body. We suggest that this way of working would ensure a greater flexibility in the research process, enable researches to engage with stakeholders as fully as possible and draw in a wider range of perspectives and in so doing become more fruitful for stakeholders. The fourth implication for research funders is to do with follow on funding. All of the workshop participants were surprised and frustrated that the research projects came to the end without the possibility to continue or develop

into the future. Follow on funding was upheld as a vital next step for transdisciplinary research projects by all those who attended our discussions. From an academic viewpoint follow-on funding may be crucial to securing impact. It is often only at the completion of a research project that the full impact of the research can be identified. Hence small amounts of extra funding may be able to secure impact beyond those participants in the research. This may include promoting research outcomes more widely with different stakeholders; for example rolling out a new way of working or decision support system, developing wider testing of methods or results, or promoting and marketing new models and new ways of working.

To conclude, stakeholders can be very positive about participating in academic research projects and have a wealth of knowledge to bring to projects. Participation was fuelled by a desire to accumulate more knowledge from varied perspectives both other stakeholders and from academics. Negotiation and working iteratively helped stakeholders and researchers to expand their knowledges about an issue, understand each other's views and hence helped reach common understanding (although not necessarily agreement). Embracing the idea that knowledge was multiple and was as likely to be held by community based stakeholders or professionals, as by the research teams were critical to the development of such dialogues. Transdisciplinary research is thus highly relevant and we argue should be a foundation of impact assessments of academic research. To maintain this way of working academic research should learn to recognise the more intangible benefits to stakeholders as well as the more explicit management outcomes. To maintain and sustain stakeholder engagement in academic research we should reflect on the process of engagement and participation, why stakeholders are willing to be involved in research, what they hope to achieve (as well as what we hope to achieve in a project) and how we should communicate during and post research. Critical to the co-production mode of transdisciplinary research is maintaining flexibility within the research process both in framing, how the research is conducted and in the meaning of what constitutes 'success'.

651

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655

656 **9 References**

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